

WHAT IS CLAIMED IS:

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1. ~~A method for antialiasing a video graphic, comprising the steps of:~~
rendering the pixels and, during the step of rendering, determining if
an edge pixel of a polygon is being rendered;
defining a sample point within each pixel and determining if the
sample point lies within the polygon or outside of the polygon, and if the sample
point lies within the polygon, setting the color of the edge pixel to the color of the
polygon and, if the sample point lies outside of the polygon, setting the color of the
edge pixel to the color of the background;
calculating the percentage of the pixel that lies in the space associated
with the sampling point;
storing the color of the pixel in a frame buffer in association with the
percent value that lies in the space associated with the sample point and in
association with an indication that the sample point lies within the polygon or outside
of the polygon;
15 in a video processing step, performing the steps of:
fetching the pixel information associated with a pixel to be
output;
for an edge pixel, determining from the color indication
associated with the pixel if the color associated with the pixel is associated
with the background or with the color of the polygon;
20 if the pixel color is that of the polygon, blending the color of
the pixel with the color of a neighboring pixel outside of the polygon in a
percentage defined by the stored percentage such that the percentage of the
stored color is equal to the stored percentage value and the percentage
25 blended from the neighboring pixel is that associated with the percent of the
pixel having been determined to lie outside of the polygon;
if the pixel is the color of the background, blending with the
color of the pixel the color of a neighboring pixel in the polygon in a

percentage that equals the color of the pixels multiplied by the percentage lying outside of the polygon and the color of the polygon multiplied by the neighboring pixel or polygon multiplied by the percentage of the pixel lying within the polygon.

2. The method of Claim 1 wherein, in the step of defining the sample point, comprises defining the sample point as the top left corner of the pixel in the output display grid associated with the video processing step.

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3. A method for antialiasing edge pixels in a rendering operation, comprising the steps of:

determining coverage parameters associated with an edge pixel on an edge of a polygon being rendered that is stored in a first buffer;

5 creating an antialiasing value representing the relationship of the edge pixel to its surrounding neighbors as to the amount of color that is to be blended into the edge pixel of a color corresponding to that of its surrounding neighbors; and

storing the antialiasing value in a second buffer in association with the edge pixel in the first buffer.

4. The method of Claim 3, wherein the created antialiasing value is a single antialiasing value represented as a digital word.

5. The method of Claim 3, wherein the step of creating the antialiasing value comprises the steps of:

supersampling the edge pixel during rendering thereof to provide a plurality of subpixels, wherein each of the subpixels contains information as to coverage by the polygon; and

5 converting the coverage pattern of the subpixels into a single antialiasing value that represents the positional relationship of the coverage as to neighboring pixels.

6. The method of Claim 5, wherein the single antialiasing value represents both coverage percentage and the coverage pattern.

7. The method of Claim 5, wherein the single antialiasing value comprises a map of the subpixels.

8. The method of Claim 7, wherein the single antialiasing value has a plurality of bit associated therewith in a digital word of a length equal to the number of subpixels, with each bit having a value that represents whether the subpixel is covered.

9. The method of Claim 5, and further comprising the step of filtering the edge pixel prior to a display operation, comprising the steps of:

- retrieving the edge pixel and the associated antialiasing value;
- determining the color of at least one adjacent pixel to the edge pixel;
- 5 blending the color of the at least one adjacent pixel with the edge pixel as a function of the positional relationship of the subpixels in the supersampled edge pixel to provide an antialiased pixel; and
- storing the antialiased pixel in a frame buffer.

10. The method of Claim 9, wherein the step of determining comprises the step of determining the color of at least two adjacent pixels to the edge pixel, and the step of blending comprises blending the color of the at least two adjacent pixels with the edge pixel as a function of the positional relationship of the subpixels in the supersampled edge pixel to the at least two adjacent pixels to provide the antialiased pixel.

11. The method of Claim 5, wherein the step of creating the antialiasing value for the edge pixel is operable to further create a depth value in association with the antialiasing value, which depth value comprises the depth value of the subpixel that is covered by the foremost polygon.

12. A graphics engine for antialiasing edge pixels in a rendering operation, comprising:

5 a rendering engine for determining coverage parameters associated with an edge pixel on an edge of a polygon being rendered that is stored in a first buffer;

an antialiasing engine for creating an antialiasing value representing the relationship of the edge pixel to its surrounding neighbors as to the amount of color that is to be blended into the edge pixel of a color corresponding to that of its surrounding neighbors; and

10 a second buffer for storing the antialiasing value in association with the edge pixel in said first buffer.

13. The graphics engine of Claim 12, wherein the created antialiasing value is a single antialiasing value represented as a digital word.

14. The graphics engine of Claim 12, wherein said antialiasing engine comprises:

5 a supersampling engine for supersampling the edge pixel during rendering thereof to provide a plurality of subpixels, wherein each of the subpixels contains information as to coverage by the polygon; and

a conversion device for converting the coverage pattern of the subpixels into a single antialiasing value that represents the positional relationship of the coverage as to neighboring pixels.

15. The graphics engine of Claim 14, wherein the single antialiasing value represents both coverage percentage and the coverage pattern.

16. The graphics engine of Claim 14, wherein the single antialiasing value comprises a map of the subpixels.

17. The graphics engine of Claim 17, wherein the single antialiasing value has a plurality of bits associated therewith in a digital word of a length equal to the number of subpixels, with each bit having a value that represents whether the subpixel is covered.

18. The graphics engine of Claim 14, and further comprising a filter processing engine operable to filter the edge pixel prior to a display operation by:

- retrieving the edge pixel and the associated antialiasing value;
- determining the color of at least one adjacent pixel to the edge pixel;
- 5 blending the color of the at least one adjacent pixel with the edge pixel as a function of the positional relationship of the subpixels in the supersampled edge pixel to provide an antialiased pixel; and
- storing the antialiased pixel in a frame buffer.

19. The graphics engine of Claim 18, wherein said filter is operable to determine the color of at least two adjacent pixels to the edge pixel, and blend the color of the at least two adjacent pixels with the edge pixel as a function of the positional relationship of the subpixels in the supersampled edge pixel to the at least

5 two adjacent pixels to provide the antialiased pixel.

20. The graphics engine of Claim 14, wherein said antialiasing engine is operable to further create a depth value in association with the antialiasing value, which depth value comprises the depth value of the subpixel that is covered by the foremost polygon.